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## THE BADGER, *MELES TAXUS*.

By THE EDITOR.

### PLATE I.

MANY people seem to be under the impression that the Badger, if not actually extinct in the British Islands, is at all events a very scarce animal at the present day. This is far from being the case. In many parts of the country the Badger is still not at all uncommon, and in certain districts which might be named it is even on the increase, owing to the protection afforded it. The reason for its supposed scarcity arises from two causes, firstly, the nature of its haunts, which are generally in the deep recesses of large woods, fox-coverts, and quarries; and, secondly, the nature of its habits, which are shy and retiring, and chiefly nocturnal.

A full-grown Badger will stand about a foot in height at the withers, and measure from 2 ft. 6 in. to 3 ft. in length, weighing perhaps 25 lbs. to 30 lbs. In appearance it may be described as having the head small, with small rounded ears, and tapering towards the snout; white in colour, with a longitudinal black stripe on each side of the face extending backwards from the snout, and widening so as to include the eyes and ears; the tail short and bushy, from six to seven inches in length; the legs robust and short; feet plantigrade, with five toes armed with strong curved claws, well adapted for digging and burrowing. The skin (which is remarkably loose and thick, enabling the animal wherever seized to turn upon its assailant)

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is clothed with short fur, interspersed with longer coarse hairs of a brownish grey colour; the lower jaw, throat, and under parts as well as the inside of the legs and feet, being black. A good idea of the animal's general appearance is afforded by the accompanying figure (Plate I.), which has been lithographed from a photograph taken from the life.

The strength of jaw in the Badger and the sharpness of its bite are proverbial. Those who may have the opportunity of examining a skull should note the peculiar way in which the lower jaw is articulated, quite unlike that of any other of our wild animals. The glenoid surface of the upper jaw is so curved round the condyle of the lower jaw as not only to support its weight, but to render its separation almost impossible without fracture. This peculiarity was long ago remarked by Sir Thomas Browne, the celebrated physician of Norwich, who, writing in 1681 to his son Edward, and referring to a Badger's skull which he had given to Dr. Clarke, observed\* :—"The lower jawe needes no tying to the upper, but would move and holde to the upper jawe without any tye." The same writer also has a curious chapter† on the question whether (as the ancients believed) a Badger hath the legs of one side shorter than the other, a fabled peculiarity to which a previous writer and namesake, William Browne, the author of 'Britannia's Pastorals' (1613), has thus alluded in verse :—

"And as that beast hath legs (which shepherds fear,  
Yclept a Badger, which our lambs doth tear),  
One long, the other short, that when he runs  
Upon the plain, he halts; ‡ but when he runs  
On craggy rock, or steepy hills, we see  
None runs more swift or easier than he."

That the Badger was at one time very generally distributed throughout England seems probable, not only from the number of fossil remains which have been found in various parts of the country in deposits which prove it to have been co-existent with the Mammoth and Megatherium, but also from the number of

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\* Sir Thomas Browne's Works, ed. Wilkin, vol. i. p. 310.

† *Op. cit.* vol. ii. p. 408.

‡ Like W. Browne's verses! The Badger was formerly supposed to be destructive to young lambs.

places which have been named after it. Its ancient name appears in Brockhurst, Shropshire; Brockenhurst, Kent; Brockenborough, Wiltshire; Brockford, Suffolk; Brockhall, Northamptonshire; Brockhampton, Oxford, Dorset, Gloucester, and Herefordshire; Brockham Green, Surrey; Brockholes, Lancashire and Yorkshire; Brock-le-Bank, in Cumberland; Brocklesby, Lincolnshire; Brockley, Suffolk, Somersetshire, Herefordshire, and Kent; Brockmoor, in Staffordshire; and Brockworth, in Gloucestershire.

This name for the animal, evidently of Celtic origin, is found in Welsh and Cornish *broch*, in Irish and Gaelic *broc*, and in Danish *broc*, and was bestowed doubtless on account of its striped face. In Gaelic we have *brocach*, meaning "speckled" or "grayish," and the Danish word *broget* has a similar meaning. The less familiar name "Bawson" has much the same signification, *bawsened* meaning "striped with white."

Another old-fashioned name for the Badger, viz. *the Gray*, in French *le Gris*, had likewise reference to its colour. The animal is thus designated in the 'Book of St. Albans,' 1486 (fol. iiij. rev.), and in many early treatises on hunting. In some of the old "Household Books," too, may be found entries of payments made for robes and cloaks *furred with gris*, others being bordered with fox or coney, thus indicating the use to which the Badger's skin was formerly applied. The derivation of the word "Badger" has been variously explained, or, as Bell puts it, is "of very uncertain origin." He quotes Skinner, who derives it from the Teutonic *back*, the jaw, as if *backer*, on account of the animal's great strength of jaw; but this seems very far-fetched. Professor Skeat regards it as "a nickname, the true sense of M. E., *badger* or *bager* being 'a dealer in corn,' and it was, presumably jocularly, transferred to the animal because it either fed or was supposed to feed upon corn." "This fanciful origin," he adds, "is verified by the fact that the animal was similarly named *blaireau* in French, from *blé*, corn." But this is surely quite wrong. The diminutive termination of the word *blaireau*, seen in *perdreau*, *faisandeau*, *lapereau*, &c., suggests some other etymology. Perhaps it would be again too "fanciful" to suggest a derivation from the verb *bleuir*, to turn bluish, or greyish, although it may be remarked that *bleu* is sometimes used in the sense of "blue-gray," or "gray," e. g., in the case of the so-called "blue hound of La Vendée."

But, in regard to our English word "Badger," may it not be a corruption from the French *bêcheur*, a digger, from *bêcher*, to dig. Our language is full of such corruptions from the French (*e.g.*, cray-fish, from *écrevisse*), and our knowledge of the animal's habits renders the suggestion sufficiently plausible.

It is perhaps hardly necessary to trace in detail the present distribution of the Badger in the British Islands, or mention the name of every locality in England where it is still known to exist, but it may be of interest to note that the pages of this journal in different years contain evidence of its occurrence in the following counties:—Berkshire, 1867, p. 631; 1879, p. 263. Cambridge, 1868, p. 1176. Cumberland, 1867, p. 822. Cornwall, 1864, p. 9219; 1882, p. 66. Essex, 1882, p. 303. Hampshire, 1880, p. 252. Kent, 1867, p. 787. Leicestershire, 1884, p. 271; 1885, p. 167. Lincolnshire, 1868, p. 1129. Norfolk, 1864, p. 9016; 1871, p. 2753. Oxfordshire, 1882, p. 146. Shropshire, 1864, p. 9219. Somersetshire, 1870, p. 2017. Suffolk, 1869, p. 1926; 1881, p. 461. Surrey, 1877, p. 251. Warwickshire, 1864, p. 9218. Yorkshire, 1880, p. 251; 1884, pp. 63 and 174.

From other sources of information we learn that it occurs in Derbyshire (Melland, 'The Field,' Jan. 24th, 1880); Devon (Bellamy, Rowe, and D'Urban); Dorset (Mitford); Durham (Tristram, and Backhouse); Glamorgan (Dillwyn); Gloucester (Bell); Isle of Wight (More); Lancashire ('Naturalist,' 1884-5, p. 128, and 1886, p. 36); Middlesex (Harting); Northumberland (Meynell & Perkins, and Cordeaux); Staffordshire (Garner, and Masefield); Wiltshire (Harting); and Worcestershire (Dr. Hastings).

With regard to Scotland, Mr. Harvie Brown's excellent account of its distribution there ('Zoologist,' 1882, pp. 1—9 and 41—45) leaves little or nothing to be desired. He states that it occurs generally throughout the mainland of Scotland, but does not appear to be indigenous to any of the islands, though it has been introduced into Jura, and upon Ailsa Craig.

In Ireland, according to Thompson, the Badger still maintains its ground, "perhaps in every county" (Nat. Hist. Ireland, vol. iv.).

One of the best accounts published of the habits of this animal is that given by Charles St. John, in his 'Wild Sports and Natural History of the Highlands.' It is full of interesting facts derived, in a great measure, from personal observation, and



should be read *in extenso* by everyone desiring accurate information on the subject.

By many people the Badger is regarded as a solitary animal, but in out-of-the-way places, where it is seldom disturbed, it appears to be sociable enough. When staying out at night in the great woods belonging to Earl Bathurst, in Gloucestershire, I have had three in sight at one time, and watched their movements within thirty yards of where I was seated. St. John once counted seven in view at once on the south shore of Loch Ness. The habits of the animal are strictly nocturnal, and it is only in the summer evenings, when the darkness lasts but a few hours, that it is ever met with while it is light. During winter it not only keeps entirely within its hole, but fills up the mouth of it to exclude the cold and keep out any unwelcome intruder.\* It will remain a long time without food in winter, as proved by the absence of its footprints in the snow around its den, and sleeps a great deal, curled up with its head under its breast. If dug out at this time of year it will be found to have the forepaws quite wet, as if they had recently been in the animal's mouth.

Huntsmen are often heard to say that they dislike Badgers because they drive the Foxes away, and dispossess them of their burrows. But this is quite an erroneous idea, for the two species not only live on very good terms, but have been known to occupy the same burrow. An instance of this came under my notice in the woods near Wardour Castle, Wiltshire; and a second case, known to me, occurred in Leicestershire, where, for at least six years, a vixen Fox reared her litter in the same earth with Badgers. This happened on the property of the late Mr. Alfred Ellis, of "The Brand," near Loughborough, who was a great lover of natural history, and took great pains to protect a colony of Badgers which he had established there, solely for the pleasure of studying their habits. In a letter to 'The Times,' of October 24th, 1877, which I have preserved, he gave a most interesting account of his observations; and as the experiment is somewhat unique of its kind, it is worthy of being

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\* In Sweden, according to Ekström, the winter sleep of the Badger generally lasts from the middle of November until the middle of March, dependent upon the season. That the winter sleep is not deep is proved by the fact that if a long thaw sets in they will leave their burrows and come out to seek for food.

again related in his own words, and thereby rescued from oblivion; for 'The Times' is not one of the journals usually consulted by those in quest of zoological information. Mr. Ellis writes:—

“About ten years since the Badger was established here, but it was not until the third attempt that my efforts prospered. The Badgers then introduced, or their successors, have bred every year, and as not more than one pair remain in permanent occupation, it is probable that there are many more of these animals in this country than is generally supposed; but their shyness, their colour, and the short time they require to obtain their food, and the recesses of the woods in which they delight to dwell, make it no easy task to study their life and habits. The deep earth in which our Badgers live is only 150 yards from the window at which I write. The building of this house two years ago did not disturb them, and they have shown an increasing confidence and trust. The Badger breeds later than the Fox, and it was the middle of March this year before the preparations for the coming family were made. These consisted in cleaning out the winter bed and replacing it by a quantity of dry fern and grass, so great that it would seem impossible the earth could receive it. In June the first young Badger appeared at the mouth of the earth, and was soon followed by three others, and then by their mother. After this, they continued to show every evening, and soon learnt to take the food prepared for them. The young are now almost full grown, and, forgetting their natural timidity, will feed so near that I have placed my hand on the back of one of them. The old ones are more wary, but often feed with their family, though at a more cautious distance. Their hearing and sense are most acute, and it is curious to see them watch, with lifted head and ears erect, then, if all is quiet, search the ground for a raisin or a date. But the least strange sight or sound alarms them, and they rush headlong to earth with amazing speed.

“The Badger, like the Bear, treads upon the whole heel, and in its walk closely resembles that animal. They caress each other in the same grotesque manner while they gambol at play, and at times they utter a cry so loud as to startle any one ignorant of its source. It is not unlike the chatter of the Stoat, but many times louder. On fine evenings we can watch them dress their fur-like coats, or do kind offices for each other, and

search for parasites after the manner of Monkeys. No creature is more cleanly in its habits. Over their earth hangs a birch tree, from which grows a horizontal bough 18 in. from the ground. On this they scrape their feet in dirty weather, and keep their house inodorous by depositing their excrement at one place for many months, and covering it with earth. The hybernation of the Badger is not like that of the Hedgehog, continuous and complete, but is irregular and is probably influenced by the character of the winter. I have known the mouth of the earth covered with a coat of snow for fourteen days, and it might have been much longer before they came forth, while they may sometimes be tracked in a thin snow for a long distance.

"As the winter approaches, the old bedding is replaced by dry fern and grass, raked together by their powerful claws. This is often left to wither in little heaps till dry enough for their purpose. Partially concealed, I have watched a Badger gathering fern and using a force in his collection quite surprising.

"Bell, in his 'Quadrupeds,' quotes Buffon as stating that Badgers are fond of wasps' nests. This is true, for, like the Bear, they love honey and sweet food.\* I once heard a pair of Badgers fighting, and crept upon the ground until within a few yards of the angry conflict, but the bracken hid them from view. Next morning I visited the place. A wasps' nest had been stormed and eaten, very little of the comb remained, and not a dozen homeless wasps. That summer I myself saw the wrecks of seven wasps' nests taken by the Badgers in one field, and this autumn they are digging out every one they can find.

"The Badger and the Fox are not unfriendly, and last spring a litter of cubs was brought forth very near the Badgers; but their mother removed them after they had grown familiar, as she probably thought they were showing themselves more than was prudent.

"Much of what I have here described has been observed by many of my friends, but now the nights are getting longer we see but little of our amusing and curious neighbours, and shall probably not renew their acquaintance until the early summer of another year."

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\* There appears to be a slight error of observation in the passage quoted. If Buffon states that it digs up wasps' nests for the sake of the *honey*, he should have said for the sake of the *larvæ*, as wasps do not store honey.

During the ensuing autumn the following supplementary account was furnished by a relative :—

“ I was on a visit to my brother-in-law in Leicestershire, and on the second evening after my arrival, whilst sitting at the open library window, which opened down to the ground (and to which, of a winter's morning, the Squirrels come quite boldly for nuts put for them every day), watching the sunset, and cooling myself after a good game of lawn tennis, my brother-in-law came on to the lawn with a small basket in his hand, and asked me if I would like to come and see the Badgers fed. Of course I would. So going across the garden, and through a little gate in the iron fence, we stood a few yards from the fence in a thin plantation, on the side of a steep bank overgrown with fern, gorse, and heather. After standing a little on one side, among the bushes, to conceal ourselves, my brother-in-law threw the contents of his basket along the grass path that led to the earth, the main entrance of which we could plainly see, it being only about eight yards from where we were standing. After remaining motionless for about two minutes, I saw the head of a Badger at the mouth of the earth, and after cautiously looking and sniffing around came fully out, and began picking up the food, which consisted of dog biscuits broken up small, and raisins, the latter being most eagerly sought for. Presently another came out, and appeared more courageous than his companion by the way he hunted for raisins in the grass, and by the time they had picked up a few bits they were joined at short intervals by two more, and lastly the two old ones came out and commenced feeding, after assuring themselves that all was safe. It was most curious to watch how, on any unusual sound being heard, they would stop feeding and listen, just like small bears, with head thrown slightly up and ears erect; and then, as the gamekeeper in the adjoining wood fired his gun at a rabbit sitting outside the cover, the whole lot would shuffle off and tumble into their earth, one over the other, in great haste. But they soon came forth again, looking as though they had been scared without much reason, the young ones to continue their search for raisins, and the old ones, after emerging far enough to reach a bit of biscuit, would sneak back with it into the earth. The young were nearly full grown, and uncommonly pretty they looked with their fine-kept grey coats and curiously-striped faces, all feeding so close together at times



that you might have covered them with a sack. They are a very cleanly animal, and will not take into the earth the mud that clings to their feet after a wet night, but remove it with the aid of a branch of a silver birch-tree that overhangs the entrance. After remaining long enough to satisfy ourselves, we stepped out of the bushes, when, of course, the Badgers scampered down their hole on seeing us. Great pains have been taken to get these animals to frequent the place, my brother-in-law taking the trouble to get some from Gloucestershire some years ago to turn out. He tells me they have bred for some years past in the same place, so that he must have helped to increase their number in the neighbourhood, but I expect they get destroyed in their wanderings.

“The good results of having such animals about are that there are no wasps’ nest about the place, these creatures having hunted out all their nests for the sake of the grubs. I noticed that directly the food was thrown down for the Badgers, several rats made their appearance from the rabbit-holes, several of which were close by, and were great pilferers of the food, much to our disgust, but apparently unheeded by the Badgers. It is difficult to kill the rats, except by poison, and that is too dangerous where there is nearly always a litter of cubs on the place. This lot of Badgers, my brother-in-law tells me, are not nearly so frolicsome as last year’s were. Last year’s, he said, would stand on their hind legs and play with one another, and search each others’ coats for vermin, and otherwise amuse themselves. All this I saw at less than a hundred and fifty yards from the house on most evenings of my stay of a fortnight, so that they do not seem to mind the proximity of human habitations.”

It was after the date of this letter that the vixen Fox above referred to became accustomed to the presence of the Badgers, and brought up her litters annually in the same earth with them.

In April, 1886, as related in ‘The Field,’ of May 15th, 1886, a gamekeeper in Co. Meath, traced a Badger into a Fox’s breeding earth in a small wood. He at once put down three traps at the mouth of each of the two holes leading into the earth the same evening. Next morning early he visited the earth, and, to his astonishment, found the Badger trapped in one hole, and a vixen Fox, suckling young, trapped in the other. The keeper released the vixen into the earth, where she had her

cubs laid up at the time, and left her there. He saw her next day carrying a rabbit to the earth, and she did not seem lame. The Badger, a male, a few days after died, as it appeared, from paralysis of the tongue."

Thus it is clear that the reported animosity between Badgers and Foxes is erroneous. Wild animals of the same order live, as a rule, in harmony, especially as in this case where neither species prey upon the other.

The food of the Badger is of a very miscellaneous nature, animal as well as vegetable. Roots of various kinds, the bulbs of the wild hyacinth, earth-nuts, beech-mast, acorns, fungus, blackberries, birds'-eggs, field-slugs, snails, earthworms, beetles, frogs, snakes, field-mice, moles and young rabbits, have all been ascertained to form part of the Badger's "bill of fare." Even the Hedgehog falls a prey to this omnivorous animal, and is easily killed by a Badger, notwithstanding its defensive armour.

A correspondent writing in 'The Field' of March 23rd, 1872, remarks that "the pitiful wail of a Hedgehog when caught by a Badger is not easily forgotten; for although he will curl himself up and be torn in pieces by a terrier without a cry, the moment a Badger approaches him he commences the most piteous cries, and death seems long and painful, for the Badger sucks the blood before devouring the body." The same writer adds, that both Snakes and Vipers are killed and eaten by the Badger. He says:—"I have often given Badgers both the black and red adder alive and well, and they are quickly killed in the same way that a good terrier performs on them—seizing hold of them in the middle, and shaking them rapidly, after which you quickly hear the crunch, crunch, of the Badger's jaws."

The question is sometimes asked whether the Badger is destructive to game. Keepers have been heard to say that they would rather have half a dozen Foxes in a wood than one Badger, for the latter disturbs the place by working about in all directions. But as the pheasants are all at roost by the time the Badger comes out at dusk, and the rabbits are out of the coverts "at feed," there cannot be much harm done, except when the hen-pheasants are sitting, some of which, or their eggs, very likely fall a prey to Badgers as they do to Foxes. Mr. Edward Elmhirst, of Shawell, Rugby, writing under date, 24th January, 1880, says:—"On a manor I rented for shooting

some few years ago, there were several Badgers in a known earth. Very near to this earth sat a Partridge on her nest, in a furrow of a wheat-field. One day, on going to see whether she had hatched off, I tracked a Badger by the peculiar print of his foot. He had seized the bird on her nest, and there eaten her and her eggs."

No doubt in this way the Badger now and then gets hold of a sitting bird, but winged game, as a rule, can generally keep out of his way; and it is a fact, that in certain places I know, where Badgers are common, game of all kinds is also plentiful. I am aware, however, that the Badger is very fond of young rabbits, and will dig down upon them from above and scoop them out. The holes thus made may often be seen where Badgers abound, with the prints of their feet and the marks of their strong claws—occasionally, too, some of their grey hairs sticking to the soil. They are often taken in traps baited with rabbits. St. John states that he once had a Badgers' hole dug out during the winter season. After tracing out a long winding passage, the workmen came to two branches in the hole, each leading to good-sized chambers. In one of these was stored a considerable quantity of dried grass, rolled up into balls as large as a man's fist, and evidently intended for food; in the other chamber there was a bed of soft dry grass and leaves; the sole inhabitant was a peculiarly large old dog-badger."

In such comfortable quarters as these the young are born, and are usually from three to four in number. They are blind at birth, and remain so for nine days. After being suckled for about three weeks they follow their parent, and are believed to be fully grown in two years. Mr. E. W. Holdsworth has thus described some that were born in the Zoological Gardens, Regent's Park:—

"Four young Badgers were born on March 12th, 1862, but all died in the course of forty-eight hours. The largest of the litter weighed a little more than 3 oz., and measured—extreme length, 7 in.; length of head,  $1\frac{3}{4}$  in.; length of tail,  $1\frac{1}{4}$  in.; height at shoulder,  $2\frac{1}{2}$  in. These young animals were born blind, and after their death there was no appearance of their eyes having opened. They were well covered with short, greyish-white hair, and had the two dark facial stripes faintly marked. The anterior limbs were very stout, larger and better developed

than the posterior. The head was not so much elongated proportionately as in the adult, and altogether there was a striking resemblance between these young animals and the newly-born Polar Bears except in size—the Bears being just double the length of the Badgers. There was no diminution in the appetite of the female Badger about the time of littering, as is the case with the Black, Brown, and Polar Bears, and the young did not resemble those of the Ursidæ in being abnormally small."

In the case of an animal so shy and retiring as the Badger, and withal so nocturnal in its habits, it is extremely difficult to ascertain the precise period of gestation. The subject has been frequently discussed, and various opinions have been expressed, but a good deal of the evidence adduced has been of a negative character, or at least inconclusive.\*

In 'The Field,' of December 20th, 1856, a correspondent states that, while he was staying at a friend's house, a Badger which had been shut up forty-six weeks and five days gave birth to a young one, much to the astonishment of the owner. In 'The Field,' of April 6th, 1861, Mr. H. Shaw, of Shrewsbury, states that a Badger which had been kept in confinement at Haughton Hall, Salop, from April 3rd, 1860, brought forth two young on March 12th, 1861, more than eleven months after she commenced her solitary life. In 'The Field,' of June 25th, 1864, Mr. F. Heycock, of Bedford, says that he caught a Badger, and had kept her thirteen months when she brought forth a young one. A correspondent in 'The Field,' of July 9th, 1864, says that he had dug out a female in April and kept her till June, when she died, and on opening her she was found to contain three young. This fact is, of course, antagonistic to the belief which is held by many that the pairing takes place in autumn, and that the young are brought forth in the ensuing spring after an interval of only about three months. In 'The Field,' of July 23rd, 1864, Mr. F. Allies, of Worcester, mentions two instances—one in which a Badger that had been kept by the ostler at the 'Bell Hotel,' in that city, brought forth three young ones ten months after he bought her;† and the other, in which a gentleman of his acquaintance possessed a Badger which pro-

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\* See 'The Zoologist,' 1864, pp. 9217—23.

† Confirmed by Mr. D. A. Neilson, of Hundshill, Pontefract, who saw them.—'The Field,' January 31st, 1880.



duced young when she had been kept in confinement for more than twelve months. In 'The Field' of September 17th, 1864, Mr. J. Freeland Young, of Hull, states, on the authority of Mr. John Seaman, Superintendent of the Hull Zoological Gardens, that a Badger brought forth young after being shut up in a cage there for fifteen months. In 'The Field' of March 22nd, 1868, a correspondent states that a ratcatcher named Butler, living near Oxford, had had a female Badger in his possession since November, 1866, and had kept her locked up in an iron cage. On the 1st March, 1868, after she had been thus kept in confinement for fifteen months, she gave birth to four young ones. It certainly is a very curious fact if gestation in the Badger does really extend over so much longer a period than in most animals; and if it does not, how are all these occurrences to be accounted for?

The nearest approach to a solution of the question, perhaps, has been made by Captain F. H. Salvin, who has frequently kept Badgers which littered in confinement.

Writing in 'The Zoologist' for June, 1877, he says (p. 251): "My Badger, which had her first family of one (a female) on February 27th last year, presented me with another family on February 16th this year. Naturalists will, therefore, be glad to learn that I can now settle that vexed question, the gestation of these curious animals, for this Badger has gone with young a year all but about seventeen days." After some further remarks, he concludes by saying, "It has been ascertained in Germany that the Roe has the power of suspending the time of gestation, and this seems to be the only way of accounting for the fact of wild-caught Badgers going as long as fifteen months with young."

If Professor Bischoff, of Giessen, would make the same careful researches in the case of the Badger that he has done in regard to the Roe-deer,\* and for which, perhaps, he has better opportunities than any physiologist living, we might expect ere long to have a definite and satisfactory explanation of what at present appears to be a curious anomaly.

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\* 'Entwicklungsgeschichte des Rehes.' 4to. Giessen, 1854.

THE GARDEN DORMOUSE, *MYOXUS QUERCINUS*.

BY DR. F. HELM.\*

HAVING repeatedly kept the Common Dormouse, *Myoxus avellanarius*, in confinement, I resolved to make a similar experiment with the so-called "Garden Dormouse," *Myoxus quercinus*, and chance furthered my intentions. Some "berry-pickers," who brought it to me, happened to capture one that had crept under the roots of a tree trunk. I placed it temporarily in a bird-cage made of wire, for want of a more suitable one; but before I was able to close the door properly, the Dormouse had made its way out between the wires of the cage on to the table, from whence jumping down, it ran across the room, and disappeared amongst some fire-wood that was piled up in a corner.

After fitting up another cage with crossed wires to prevent a further escape of the Dormouse, the bottom being covered with a layer of sand and hay, the wood was carefully removed, and the Dormouse, which had kept quiet all the time, was caught once more with a cloth thrown over it. Being put back into the cage, it climbed about for awhile in a restless manner, but as soon apparently as it had come to the conclusion that further escape would be impossible, it began to nibble the kernels of nuts, and lard, which were offered to it. In a short time it lost a good deal of its original wildness, but never became quite tame, and never tolerated being stroked or otherwise handled; for when seized it struggled hard, and even occasionally bit the hand, which it never did under any other circumstances. Its bite, however, was not more painful than that of any other mouse.

Its usual food consisted of hemp-seed, nuts, and meat (especially lard), but it preferred biscuits and fruit. The presence of strangers did not prevent it from feeding, taking the food it fancied most out of the hand after a little while. Of nuts, which had not been previously opened, it took little notice, seldom making an attempt to gnaw the shell through, in which it never actually succeeded. Possibly it did not consider this trouble necessary on account of the plentiful supply of food lying about in the

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\* Translated from the German of Dr. Helm, in 'Der Zoologische Garten' for July, 1887, pp. 217—219.

cage. It did not sleep much in the daytime, when a slight noise would rouse it. It would then climb about in the cage, and take food out of the hand. In the woods, too, I have repeatedly found this species of Dormouse to be lively in the daytime.

By chance I became possessed of a second specimen of *Myoxus quercinus*, which was also of the male sex. No sooner had I put it with the other one (in the daytime) than a serious fight commenced between them, which, like several others which took place the same day, was soon settled by my energetic interference. The next day, however, they seemed to agree, thenceforth living in tolerable peace, in consequence doubtless of the abundance of biscuits and fruit in the cage. Neither of them ever attempted to secure their liberty by nibbling the wooden bottom of the cage or its angular supports, which were also made of thin wooden strips. In order to cleanse the cage thoroughly from time to time, I put them into a bag made of canvas, in which they climbed about without injuring it.

As soon as I discovered their partiality for fruit and lard, I decided to try and secure a few more specimens by means of the well-known cage-trap used for birds. To effect this I fixed some food on the treadle, and scattered some hemp-seed and pieces of nut-kernels on the bottom of the trap, placing it, well covered with moss, amongst underwood not too dense, at the height of about a yard from the ground. It often happened that a Long-tailed Field Mouse, *Mus sylvaticus*, instead of the Dormouse I wanted, got caught, and nibbled its way through the cover of the trap, which did not quite close when shut, light and air being admitted by the crevice. Trusting to the different habits of the Dormouse, I did not stop up the hole through which the Long-tailed Field Mouse escaped, the result being that none of the many which I caught with this trap during that summer attempted to escape by enlarging the opening already made. They all waited quietly until released, even one which died in the trap—owing to my inability to visit it through illness—made no such attempt.

The tail of this species of Dormouse is very brittle, so to speak; it more than once happened that a piece broke off in my hand while swinging the animal by that organ. Another specimen, which got caught by its tail between the lid and the edge of the trap, managed to get away, owing to my carelessness

in opening the trap, leaving its tail in my hand. In the first specimen which I received, the skin of the tail at the tip had been rubbed off, exposing the vertebræ, but this ugly appendage it removed the first day by gnawing it off.

This species of Dormouse exists not uncommonly in the woods of the "Upper Vogtland" (Saxony), which consist almost entirely of pine and fir. It is known everywhere as "*the Dormouse*," and disliked; for it is believed by the country people that if a cow is breathed upon by a Dormouse its udder will become diseased, and that everything touched by its urine will immediately decay. Moreover the Dormouse is supposed to be as venomous at least as the Viper, *Vipera berus*, which is also common there.

The nests of *Myoxus quercinus* which I have hitherto found in these woods were built sometimes in trees, sometimes—and perhaps more frequently—amongst piles of firewood, fagots, and poles; once only did I happen to find a nest under the roots of a fallen tree trunk.

[If no error has been made in identifying the species, it is curious that the superstitious dread with which, according to Dr. Helm, the Dormouse is regarded in Saxony, attaches in this country to the Common Shrew, *Sorex vulgaris*. See Bell's 'British Quadrupeds,' second edition, 1874, pp. 145—147. In France also it is the Shrew whose bite is supposed to be poisonous. See Rolland, 'Faune Populaire de la France'—"Les Mammifères Sauvages")—1877, p. 19.—Ed.]

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## THE AUTUMNAL MIGRATION OF BIRDS IN IRELAND.

BY ALLAN ELLISON.

As a point from which to observe the passage of the numerous flocks of birds which in autumn pour into Ireland from Great Britain and Northern Europe, Shillelagh is very favourably situated. It lies in the extreme south-west corner of the County Wicklow, about eighteen miles from the sea, in a sort of valley between the off-shoots of the Wicklow Mountains on the north, and the hills extending from Croghan Kinsella to Mount Leinster on the south and south-east. This valley, as a glance at the map will show, runs in general north-east and south-west, and is so level that its rivers, the Derry and Aughrim, are joined together at their sources, the former running south-west until



it meets the Slaney, and the latter eastward and joining the Ovoca. Here then is a sort of great high road along which a large part of the migrating birds bound for the south-west of Ireland must pass, as they apparently avoid crossing mountains, and prefer to follow low-lying districts and river basins. For several years I have noticed in the months of October and November the innumerable flocks of birds, principally Starlings, Fieldfares, Redwings, Skylarks, and Golden Plover, which pass by Shillelagh and its neighbourhood, flying towards south-west along this valley or low-lying tract. Of these the most numerous, as almost among the earliest, are the Starlings. Generally in the beginning of October (the 3rd is the earliest I have noted) the first Starling flight is seen; and from that until near the middle of November there is seldom a day that they are not seen passing, always in the same direction, north-east to south-west. Quiet, fine weather, with light easterly or northerly breezes, seems most favourable for their migration; and at such times I have seen as many as twelve flocks of from fifty to some hundred birds on an average passing over one field in the course of the afternoon. They seem, however, to find no difficulty in flying in the teeth of a gale.

Wonderful is the speed with which these Starlings then dash along, far exceeding the greatest powers of flight displayed by them on other occasions. One hears the loud rush of their wings, like the distant sound of a flooded torrent; the flock sweeps by just over the tree tops, and in a moment is lost to sight. I should say their speed often equals 100 miles an hour. For some reason which I cannot explain, the flocks always appear largest, most frequent, and their speed greatest, about four o'clock in the afternoon.

A few days after the commencement of the Starling migration, Redwings generally begin to make their appearance. Their passage is never anything like so noticeable as that of the Starlings. They fly in small and rather scattered parties near the ground, passing leisurely on, apparently stopping to rest from time to time. Redwings are never very common in the district, and only at the periods of migration in autumn and spring are they seen in any numbers. Fieldfares are seldom seen until at least three weeks after the Redwings, and in their migratory habits differ remarkably from them. Instead of flying near the ground,

in frequent small parties, at short intervals, only a few flocks of them are seen passing during the season, although of vast size and at a great height. Generally about the beginning of November I have seen these flocks, at most one or two in the day, coming from north-east, and covering a large part of the sky like a cloud. This year I saw the first flight on October 16th, an unusually early date for the appearance of Fieldfares.

These occurrences are to be observed regularly every autumn, but the migration movement of last autumn has in all respects been a most exceptional one. Some of the migrants have appeared unusually early, and all in much larger numbers than I have ever before observed. On October 8th I saw the first flocks, both of Starlings and Redwings. On the same day, and for about a week after, immense numbers of Golden Plovers were passing over, flying towards the west and south-west in large V-shaped strings. This was about the usual time for Starlings and Redwings, but early for Golden Plover. On the 11th again both Redwings and Starlings were constantly passing.

On the 16th, as above mentioned, I observed a great host of Fieldfares, many thousands in number, winging their way across the sky towards the south-west. From October 17th to the beginning of November the Starling migration was at its height, the flocks being much larger and more numerous than I had ever observed in former years. I saw four within a quarter of an hour on the afternoon of the 18th. At 4 p.m. on the 22nd, the largest flock I ever saw passed over. It was in the form of a column, perhaps nearly a mile long, and must have numbered thousands, spanning the sky from horizon to horizon for more than half a minute, and was followed in a short time by two smaller flocks. All the latter part of October Skylarks were from time to time flying over, generally large straggling flocks or scattered individuals, flying nearly out of sight, but their call notes being distinctly audible.

It would be most interesting to know whether this remarkably large migratory movement has been general. I hope other readers of 'The Zoologist,' who are favourably situated for observing the arrival of winter birds, will report whether they have noticed a similar abundance of migrants this season. It was remarked to me by a friend, that the large number of Starlings and Golden Plover probably indicated the approach

of severe weather; but perhaps it was merely the result of the previous warm and dry summer which had been exceptionally favourable for the young broods.

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## NOTES AND QUERIES.

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**The use of the word "feral."**—The Rev. H. H. Slater exhibits much indignation (Zool. 1887, p. 461) against the growing use of this word, as signifying that the animal so designated occurs in a wild state. He is right in saying that "feral" is not a classical word, in this sense. But why should naturalists, of all people, restrict their vocabulary to purely "classical" words? Language must grow with knowledge. If Mr. Slater will consult the last edition of Du Cange he will find the word *feraliter* given on the authority of three writers, and explained as meaning *ferarum more*, "in the manner of wild beasts." Now I maintain that this adverb could never have been formed without a pre-existing adjective, *feralis*. The well-known classical word *feralis*, "funereal" (from *fero*), has nothing to do, etymologically, with *ferus*, "wild" (from *ferio*); and it is from the latter that the modern usage of the word has arisen. "Feral" is a very useful variant from "wild," especially in that its connotation is more restricted and definite; and I can see no reason why it should be gainsaid. Words pass out of use for centuries, and turn up again, times out of number, when occasion requires them. Surely scientific nomenclature is sufficient evidence of this.—HENRY T. WHARTON (39, St. George's Road, Kilburn, N.W.).

**The word "feral."**—In reference to Mr. Slater's remarks, I would point out that "feral" is regularly used by Darwin in the sense of "ran wild," and in the Glossary of Scientific Terms ('Origin of Species,' p. 433) is described as "having become wild from a state of cultivation or domestication." Mr. Slater says, "the adjective derived from *ferus* is *ferinus*." But *ferus* is itself an adjective, and, granting the necessity to coin a new word, I cannot see why we should be restricted to *ferinus*, with its awkward rendering "ferine," instead of the equally available and more euphonious "feral." The latter has, it is true, an old-time meaning of "funereal" (from *feralis*), but that is now quite obsolete.—ABEL CHAPMAN (Roker, Sunderland).

## MAMMALIA.

**Monkeys opening Oysters.**—On this subject our contemporary 'Nature' prints the following letter:—"So many people have expressed their surprise at hearing that I constantly saw Monkeys breaking open Oysters with a stone on the islands off South Burmah, that it may be of

interest to give a short description of their method of using such a tool. The low-water rocks of the islands of the Mergui Archipelago are covered with Oysters, large and small. A Monkey, probably *Macacus cynomolgus*, which infests these islands, prowls about the shore when the tide is low, opening the rock-oysters with a stone by striking the base of the upper valve until it dislocates and breaks up. He then extracts the Oyster with his finger and thumb, occasionally putting his mouth straight to the broken shell. On disturbing them, I generally found that they had selected a stone more apparently for convenience in handling than for its value as a hammer, and it was smaller in proportion to what a human being would have selected for a proportionate amount of work. In short, it was usually a stone they could get their fingers round. As the rocks crop up through the low-water mud, the stone had to be brought from high-water mark, this distance varying from ten to eighty yards. This Monkey has chosen the easiest way to open the rock-oyster—*viz.*, to dislocate the valves by a blow on the base of the upper one, and to break the shell over the attaching muscle. The Gibbon also frequents these islands, but I never saw one of them on the beach.”—ALFRED CARPENTER (Marine Survey Office, Bombay).

**Identity of the European and American Moose.**—In his “Catalogue of the Mammals of Massachusetts,” published in the ‘Bulletin of the Harvard College Museum’ (vol. i. p. 195), Mr. J. A. Allen remarks of the European and American Moose that their distribution is remarkably alike, reaching the Arctic coast in both continents, and extending southwards to the same isotherm. On the whole, he considers their identity as extremely probable, if not absolutely certain.

**Origin of the name “Lobster” applied to the Stoat.**—As allusion has been already made to this subject (Zool. 1884, pp. 112, 153), it may be of interest to note that the name “lobster” is used by Abraham Fleming in his English translation of Dr. Caius’ work “De Canibus Britannicis.” The word *Mustela*, which is used by the author in its generic sense, is rendered by his translator “the polecat, the lobster, the weasell,” as if enumerating the British species of the genus *Mustela*. Inferentially, then, we get the use of this name for the Stoat in 1576.—J. E. HARTING.

**The early use of Ferrets.**—A statute of 13 Rich. II., reciting that divers artificers, labourers, and others keep greyhounds and other dogs, and on the feast-days when good Christians are at church, go hunting in parks and warrens, to the great destruction of the game, enacts that “no such person who has not lands and tenements to the value of 40s. per annum, shall keep any such greyhound or other dog to hunt, nor shall use *fyrets*, hays, nets, harepipes, nor cords nor other engines to take or



destroy deer, hares, nor conies, nor other gentleman's game upon pain of one year's imprisonment."—J. E. HARTING.

**Weasels for New Zealand.**—Mr. Allbones, of Brigg, sent last week (Dec. 17th) the fourth consignment of Weasels and Stoats for New Zealand, with the view of thinning-down the rabbits. The cargo consisted of no less than 300, which have been collected from all parts of North Lincolnshire at an average cost of about 3s. 4d. each. The animals were to be fed on the way with live pigeons.—*'The Field,' Dec. 24th.*

**Habits of the Mole.**—I cannot but think that the account given in *'The Field'* of March 13th, 1875, and reprinted in *'The Zoologist'* for the same year (p. 4493), is in some respects very imaginative. With regard to the Mole's reputed habit of storing up worms in the marshy land, "where they remain alive and wholesome, and fetching them thence to their young as these require them," I have grave doubts. It is quite true that such accumulations of worms as the writer describes are found in the runs of the Mole, but, without being able to speak with certainty on the subject, it is my belief that the runs in question are disused runs into which the worms having once penetrated, eventually find their way to the depressions referred to, and are unable to escape in consequence of the steepness of the sides of the cavity and the compactness of the soil which lines it. [But if a worm be placed in a basin of water it will be seen to ascend the side, which is much more "steep and compact" than the cavities made by the Mole.—ED.] I have frequently been informed that these imprisoned worms are stored up by the Mole for future consumption, and that they are disabled before being so deposited; but what has been pointed out to me as the supposed injury has invariably proved to be the thickened segments (clitella), and the flaccid, unhealthy appearance of the worms would doubtless arise from the abnormal circumstances under which they are found. In frosty weather the worms, which form the chief food of the Mole, retire to a greater or less depth in the soil, according to the duration and severity of the frost, and are followed by the Moles; but in this country frost seldom penetrates so deeply into the soil as to prevent the Moles from burrowing, and fresh mole-workings are often to be seen when the surface of the land is icebound. Drought is the great enemy to the Mole. During the past summer they suffered severely, and might frequently be seen searching on the surface for food (and perhaps water), the worms having retired to too great a depth for them to follow. Like the Editor, I have been astonished at the rapid progress the Mole is capable of making when surprised outside its run, but if the surface were sufficiently soft to permit of its burrowing it has quickly passed out of sight. English Moles must, however, be a very degenerate race compared with Le Court's Mole, whose speed when frightened "was equal to that of a horse at full trot"; I have never read the particulars of

the "satisfactory experiment" referred to at p. 125 of the second edition of Bell's 'British Quadrupeds' in the original French [Geoffroy St. Hilaire, Cours de l'Hist. Nat. des Mammifères, 18<sup>e</sup> Leçon, pp. 34, 35. Paris, 1829.—ED.]; but I have always had a shadow of a suspicion that when the "cri effroyable" was blown into the horn which was "introduced into the passage" the momentary effect produced upon the little flags might be due rather to the vibration thus set up in the column of air than to the flight of the Mole along its burrow. [If the horn were employed as a *blowpipe* doubtless a current of air might be transmitted for a short distance along the gallery; but if used to produce a sound—*un cri effroyable*—the peculiar compression of the lips required for this purpose would operate to prevent any such current from being transmitted. The horn employed by Le Court was a cowherd's horn, *un cornet à bouquin*.—ED.] The numbers of young ones in a brood which have come under my notice were in three instances four, and in one instance three. I have more than once seen a Mole crossing a ditch; but last summer some friends of mine, sailing on the Yare ten miles below Norwich, where the river is a considerable width, saw in mid-stream what they took to be a Water Rat swimming towards the yacht, but which, to their surprise,—as they passed close by it,—proved to be a Mole. Albino Moles, in my experience, are rare; but a variety, light cream-coloured or nearly white on the upper surface, the dorsal line slightly tinged with amber, and the under surface—particularly the throat and chin—orange-buff, fading to white, is not at all uncommon. In fact, in some low-lying land in the parish of Oby it may be said to be common. My friend Mr. Frank Norgate, whose opportunities for out-door observation have only been equalled by the excellent use he has made of them, some years ago sent me sketches of three Moles' "nests" which—to use his own expression—he had "dissected." The runs, which he carefully followed up, were of a very complex character, but the general construction and the arrangements of the galleries were very similar to the plan given at p. 122 of Bell's 'British Quadrupeds.' The purpose of these curious structures does not seem to have been at all satisfactorily explained, and I trust that the Editor's article may have the effect of stimulating those correspondents, who may have the opportunity, to endeavour to clear up this and other moot points in the economy of this interesting animal.—T. SOUTHWELL (Norwich).

**Varieties of the Mole in Durham.**—I have often met an old mole-catcher and taken a stroll with him as he went his rounds—"lifting his traps," he termed it. He dropped the dead Mole from each trap, reset it, then placed it in the same or some other run. He caught a good many, for they were very plentiful where I was brought up, a few miles from Durham. I secured a cream-coloured specimen once for preservation, and have it yet.

The old man told me that he caught a cream-coloured one nearly every year, on one particular part of the estate, in some black peaty soil, which he seemed to think had something to do with the abnormal colour. In resetting his traps he was very particular never to touch the pipe or trap part with his fingers, and used to tell me that the Mole's sense of smell was so keen that should he handle the trap it would not enter it, but at once burrow to one side.—JAMES SUTTON (Durham).

**The Bank Vole in Co. Durham.**—I am able to state, from practical experience, that the Bank Vole, *Arvicola glareolus*, is to be found near this city, and no doubt elsewhere in the county. About a dozen years ago I packed some hundreds of ranunculus roots in a box for safety during the winter, and placed it on a shelf in a sort of storehouse in the garden, and near to an old fence. Happening to look at them during the winter, I found that most of them were partly or totally eaten by mice. I blamed the Common Mouse, and at once baited a wire-trap with cheese and placed it near to the box. In a few days, or rather nights, I had secured alive about half a dozen Bank Voles, and I well remember my surprise on seeing the rich rufous-red colour of their fur, so very different to that of the commoner *Arvicola agrestis*.—JAMES SUTTON (Durham).

**Bank Vole in Yorkshire.**—As I am not aware whether the occurrence of the Bank Vole, *Arvicola glareolus*, has previously been noticed in this part of Yorkshire, I forward for your inspection a specimen of what I believe to be that species, and which I found dead upon a footpath cut through furze- and thorn-bushes on the cliffs near Scarborough. Some years ago, before I had any knowledge of the distinction between *glareolus* and *agrestis*, I picked up what I took to be a specimen of the latter, but now feel pretty sure it was of the former species, for I remarked the unusually long tail.—R. P. HARPER (2, Royal Crescent, Scarboro').

[In their 'Handbook of Yorkshire Vertabrata' (p. 14), Messrs. Clarke and Roebuck characterise the Bank Vole as "reported from a few localities scattered irregularly over the whole county; probably more general, but not usually distinguished from the common Field Vole."—ED.]

**Bank Vole in Nottinghamshire.**—When out in the country the other day, near Nottingham, I saw a Bank Vole, *Arvicola glareolus*. These little creatures are not at all common, although rather widely distributed. This is only the second I have been fortunate enough to see; the other was a tame one kept by Mr. W. Rigby, taxidermist to the Natural History Museum. They make very interesting pets, and attain to better appearance in captivity than when wild. They construct a nest of grass and moss, concealed amidst dense herbage. Their favourite haunts are old ivy-covered hedge-banks, especially those from which the soil has been washed away in places, leaving hollows behind the roots which have thus become bared;

banks adjoining woods and plantations seem particularly attractive to them. In spots like this, pleasingly varied by a sprinkling of old mossy stumps, brambles, and bushes, with roots of overhanging trees, backed by deep cavernous recesses, the Bank Vole makes its burrow and forms runs in all directions, partly above and partly below the surface, probably also making use of those of the Mole. The one I saw had made its burrow in the side of a bank facing and sloping down to a small stream, the burrow evidently going into and amongst the roots of a wild rose-bush above it. The appetite of the Bank Vole has caused much trouble amongst naturalists. The one I saw emerging from its burrow slid gracefully down the bank, curled his tail around a projecting root and deliberately dived under water, shortly after emerging with the roots of the duck-weed in his mouth; this he devoured, sitting on the aforesaid root. His repast over, he cleaned himself a little, and then quietly returned to his hole, never having observed me, although I was not two yards distant.—W. FINCH, JUN. (Nottingham).

[The diving and returning with duck-weed is very suggestive of the behaviour of a young Water Vole, but we presume our correspondent is sufficiently well acquainted with both species as to have made no mistake in its identification.—ED.]

**Bank Vole in Sussex.**—Having noticed in recent numbers of 'The Zoologist' several letters on the distribution of the Bank Vole, I send some of my experiences of that little animal in Sussex. I used to catch a fair number of them near Lancing, in a disused chalk pit overgrown with bushes and weeds. I used a strong mouse-trap baited with an unbleached almond, and set it either at the mouth of a hole or near one, and covered the trap up with grass; having caught as many as I wanted, it occurred to me to try to keep one or two alive, so I put the next one that I caught in a larva breeding-cage, and it soon became quite tame; and I could let it run about a table and up my arm. Its powers of jumping were very great; it would jump from my hand on to a shelf quite a foot above it. I also caught one or two young ones nearly full-grown; these differed from the full-grown ones by their fur being of a greyish brown, with none of the red tint. In the above-mentioned pit they seemed to be the commonest of all the mice. I only caught one other species there, namely, the Long-tailed Field Mouse, *Mus sylvaticus*.—F. HEAD (41, Wimpole Street, W.).

**Bats in Middlesex.**—I have lately received, in the flesh, a specimen of the Long-eared Bat (*Plecotus auritus*, Linn.), from Hounslow, which was discovered dead in a loft. An entomological friend of mine was "sugaring" in that vicinity this summer, and, in striking at a *Noctua* which was hovering near one of his trees, secured a small Short-eared Bat (most probably *Vesperugo pipistrellus*), which made a dash at the moth at that moment. After inspecting it carefully he turned it out of his net; he describes it as "squealing pitifully like a Mouse, whilst it was a captive."



I have often noticed the Pipistrelle, flitting up and down High Street, Notting Hill, and in the neighbouring Squares at dusk.—PERCY RENDALL (16, Little Grosvenor Street, W.).

[In addition to these two other species may be named as occurring, not merely in Middlesex, but in the Metropolis—namely, the Noctule, which may be seen any summer evening flying up and down at a good height over the Serpentine, and Natterer's Bat, a specimen of which was shown to us after being captured in Thayer Street, Manchester Square. Outside the Metropolis the rarer Daubenton's Bat has been taken at Kingsbury Reservoir, and the Barbastelle at Hornsey.—ED.]

#### BIRDS.

**Cuckoo in India.**—I have been here for just one month, and during that time have constantly heard the cry of the Cuckoo. Last Sunday (June 12th) I heard it at Lackwar, fifteen miles from here. This would apparently point to Jerdon's not being correct in saying the Cuckoo is rare in India. Mr. Mutzler, the owner of this hotel (the 'Charleville'), tells me the Cuckoo is constantly heard from spring to October.—F. C. CONSTABLE (Mussoorie, June 15).—'Nature.'

[We are informed by Mr. Seeböhm ('British Birds,' vol. ii. p. 378) that in India, Ceylon, Burma, and the Philippines, our Cuckoo is only known as a winter visitor, but that a few remain to breed in the Himalayas. He adds that the very nearly allied species, *Cuculus himalayanus*, differs from it in no respect except in size (being constantly smaller), and in its note, "which is not a double one, but a single guttural and hollow-sounding note resembling that of the Hoopoe." If this is the case, the species heard by Mr. Constable at Mussoorie and at Lackwar may very likely have been *Cuculus canorus*.—ED.]

**Position of Swallows' Nests.**—Referring to Mr. Larken's note (Zool. 1887, p. 467), I can answer for a similar position of at least two nests of the Swallow. One nest was observed in a church-porch in Oxfordshire, the owners of which were constantly coming in during the service, and sometimes found considerable difficulty in getting out again. The second nest was in Sussex: in the porch over the door of a village public-house, the hen was sitting, though beer was "consumed on the premises," and the door slammed within a few feet of the nest all day long. Nests of these birds, in my experience, are always "cup-shaped," though they are usually placed at the junction of two beams.—PERCY RENDALL (16, Little Grosvenor St., W.).

**Curious Site for a Swallow's Nest.**—A short time since I heard of a very curious site for a Swallow's nest. It was placed under the flooring of a passage of a house, and the bird had to go through a hole in the boards, and then fly or creep along for some time before reaching it. Two broods were reared there. The house is only partially occupied, but the tenant

kept wood, coals, &c., in a back place, and had to cross the passage referred to often during the day, and sometimes after dark. On such occasions the bird would sometimes come out of the hole and attack the person carrying the light, but he, being fond of our feathered friends, did not resent such treatment, but retreated as soon as possible, and in other ways showed kindness to his visitor.—J. G. HAMLING (Barnstaple).

**The Treatment of Eider Ducks in Captivity.**—I received two ducks and a drake last year (in September) from the Orkneys. They had been reared mainly on earthworms, but would also eat a little oatmeal made into a ball, and bread. When I turned them on to my water (though I had given them opportunities in an aviary of bathing and getting their oil-glands to work) they got miserably soaked, and were all three more or less affected with lung disease afterwards. One duck pined away and died, the others got better. The interior of the duck that died was much affected with tubercle on the vital organs, and immediately after death there was a quantity of green mould within the cavity of the breast. I got the other two birds gradually to eat barley-meal and bread as their main food, with ox-liver, or earthworms, at one meal. I fed them three times a day. During last winter both of them were at times very capricious in their feeding, sometimes one and sometimes the other going amiss for three or four weeks at a time, and I never thought they would survive. Generally they would never touch shell-fish of any kind; but when they were amiss it sometimes happened that they would fancy periwinkles or mussels, and then I got more of these for them, and they became strong again. I never found that my birds would eat the shell-fish in their shells, nor, if the latter were broken and crushed. They always required the "winkle" or mussel to be shelled and thrown to them, or they would not touch them. They "went wrong" perhaps four times, each bird, between October, 1886, and May, 1887. Once or twice they would eat nothing at all for three or four days (*i. e.*, the bird that was unwell at the time), and then it began to feed greedily on maize and barley, and recovered on that diet. When the male began to assume the dull plumage of early summer (I will refer to their change of plumage later) he very nearly died. During June, July, and August both birds did well, mainly upon barley-meal. In September the drake was very bad indeed, and a day or two later the duck was slightly affected,—with "roup," I believe, a nasty discharge running from the tear-duct of the eye, and eventually the drake lost the sight of one eye, and the other was weakened. This eye is better now. The drake was moulting heavily during this illness, and it went hard with him; but now both birds seem very well. At this moment (Nov. 20th) they are floating in a small pool surrounded by ice, for we have had some keen frosts lately, and both of them look as healthy as possible. I have never got my birds to eat any fish, though I have often offered it to them in various ways. The male eats bread, especially brown

bread-crusts, pretty freely, but the duck seldom. My practice is to give them as much barley-meal as they will eat (very little just now) at 8.30 a.m.; then to let them have some pieces of ox-liver, or—when many rabbits are being killed—of fresh rabbit-liver. At dusk the other water-fowl are fed with maize and barley, and the Eiders dive and work away at this, and get a good deal. After this they have as much liver as they can eat, varied occasionally with earthworms. As to plumage, I feel certain that if my drake had been in sound condition during the past twelve months, and under less unnatural conditions, he would have acquired adult plumage this winter. Some time in October last year the drake began to show a few white feathers on the crop and neck, also on the flanks; while some few of the feathers on the back began to change their colour, and became by March of a silvery white, where they had been black. By that time the crop had become of a pure white. In June this had become speckled with a few dark brown and dark grey feathers, and by the beginning of August it was more dusky than white, and at a hundred yards distance the drake was only distinguishable from the duck by the contrast between her reddish brown colour and his sooty faded brown. It was clearly the nearest approach to the plumage of the duck that he was intended to attain, at least in his second summer. The duck Eider threw all the flight-feathers in her wings in one night, quite at the end of August, and, about a fortnight later, the drake threw almost the whole of his in the course of one day, and their body-feathers came off, and were replaced by new ones in an extraordinarily short space of time. The drake is now in adult plumage, except that the green of the nape is faint and speckled with greyish brown; but it is getting more distinct each week. The cap of the head also, where it should be pure black, is speckled in the same way, the lighter feathers showing amongst the dark ones. The shoulders and back are patched with dark colour, and the scapulars are only just beginning to change to white. The crop, breast, belly, and sides of the bird show the complete adult colouring. I am aware that the Eider has been successfully kept, and even bred, at the Zoological Gardens in Regent's Park. Possibly my birds were mismanaged before they reached me, and may have lost vigour of constitution; but, for whatever cause, they seem to me the most difficult of British ducks to keep in health. I have Goldeneye, Scaup, and Scoter, at this moment, feeding freely on maize and barley, and apparently as thriving, and doing as well, as the commoner ducks which are swimming with them and with the Eiders in the same piece of water. Most of these find their own living during the summer months, only drawing up in the autumn months to resume the grain diet, which they had neglected since the water-weeds began to grow in the previous spring.—W. H. ST. QUINTIN (Scampston Hall, Rillington, York).

**Birds observed at Rye.**—During the months of September and October large flocks of waders were to be seen on the mud-flats near the

harbour. Prominent among them were Knots (*Tringa canutus*), Dunlins (*T. alpina*), Sanderlings (*Calidris arenaria*), Ringed Plover (*Æ. hiaticula*), while in lesser numbers occurred the Turnstone (*S. interpres*), Kentish Plover (*Æ. cantianus*), Redshank (*Totanus calidris*), Greenshank (*T. glottis*), Sandpiper (*T. hypoleucus*), together with an occasional Little Stint (*Tringa minuta*), and Grey Phalarope (*Phalaropus fulicarius*), the last but one occurring in small flocks of eight or nine, several of which were obtained by local collectors. In the month of November birds were much less plentiful, but with hard work a few could be always obtained, such as Grey Plover (*Charadrius helveticus*), Ringed Plover, Golden Plover (*C. pluvialis*)—these latter being far from plentiful, owing to the absence of cold weather. On November 16th I had the unexpected pleasure of seeing a Buzzard (probably *Buteo vulgaris*), but, not having my glasses at the time, could not decide for certain. When first seen it was surrounded by four or five Rooks who were mobbing it. Every now and again one of these would mount above it, and flying downwards would peck at its back, of which the Buzzard seemed not to take the slightest heed. I lay for three-quarters of an hour watching it gradually sailing upwards and seawards, each circle being longer than the last, until it disappeared from sight. The flight of this bird seemed to require no effort. I hardly saw it flap its wings more than once or twice all the time I watched it. No doubt it will sooner or later fall a prey to some one on the look out for rare British birds. Out at sea Scoters (*Ædemia nigra*) occurred in large numbers, but very wild, having been much shot at, with an occasional Velvet Scoter (*Æ. fusca*) and Divers (*Colymbus septentrionalis*), and I one day saw a splendid Great Northern Diver (*C. glacialis*), but could not get near it. — W. H. NEWBERRY (105, Wood Street, London).

**Sale of a Great Auk's Egg.**—On Dec. 13th a number of naturalists were attracted to the Auction Rooms of Mr. Stevens in Covent Garden, by an announcement that a sale of birds' eggs would take place, amongst which was an egg of the Great Auk, *Alca impennis*. This egg, the property of the Rev. Henry Burney, of Wavendon Rectory, Woburn, Bedfordshire, had been purchased by him for £31 10s., in July, 1865, when four eggs of this bird (duplicates from the Museum of the Royal College of Surgeons) were disposed of by auction in the same room. It was now to change hands once more. The biddings commenced at fifty guineas, and, increasing by additional offers of five guineas and ten guineas, quickly ran up to 160 guineas (£168), at which price it was knocked down to Mr. Leopold Field, of Lambeth Marsh, and Harlesden, Middlesex.

**Notes from Western Australia.**—Some months have elapsed since I forwarded my last notes, and I do not even know if they were received, no copies of 'The Zoologist' having reached me from home since then.



[The notes referred to appeared in 'The Zoologist' for September (p. 352). —ED.] The first Emu's eggs were brought in by natives on May 25th. These birds retire to the neighbourhood of the sea to breed, making their nests close to the salt marshes, which extend for some miles in breadth along the coast. The first egg laid is covered by twigs; as more eggs are laid more twigs are added and placed under the eggs. I was on the coast some weeks, and noticed the White-tailed Sea Eagle and Black Oystercatcher commonly. The Wedge-tailed Eagle, *Aquila audax*, breeds near the coast, being least disturbed there. I noted a nest with two eggs on June 2nd, built on the top of a low bush. There being no large trees or crags here, the Eagle's eyrie is an extremely unromantic affair. One nest I saw thirty feet from the ground, formed of about a cartload of sticks. It was in the fork of a gum tree. All others I have seen have only been from six to twenty feet from the ground in bushes or low trees. Sometimes an extremely slight nest is constructed. To show the number of these magnificent birds, I may mention that fifteen were poisoned in one day upon a lamb. I myself had five down in about half an hour from another poisoned carcase. It was a fine sight to see these birds fighting over the meat. I picked one up afterwards, and after standing on his back some minutes concluded he was dead, and shouldered him to my camp, as I wished to skin it. On the road it suddenly revived and attacked my rear so savagely, that I was glad to drop the bird and kill it outright before going farther. Last month I took a trip up the Minilya river, sixty miles north from this. Little Quails were in thousands, and I got a great number of eggs. Some young had hatched. The settlers there were very anxious for me to see some beautiful "Crested Partridges," which they said were common, but I was not lucky enough to find any. The Red-tailed Cockatoo, *C. naso*, occurs there, and the Black Swan breeds there in good seasons; both young and eggs have often been secured: I imagine this is a very long way north to breed. Large flocks of what the settlers term "Nichol Bay Pigeons" were frequently seen, but I was unable to identify them. I cut out a nest of the Nankeen Kestrel, *S. cenchroides*, containing five eggs, from a hollow gum branch. In a bush below was a large snake, which we killed. I find a considerable difference in the nesting here from at home; one has to look out for snakes, poisonous caterpillars, &c., and a colony of serpent-ants in possession of a tree are very awkward customers to go through. The grub of a small moth was eating off a lot of vegetation, and a swarm of Grasshopper-birds or "Swarmer," *Glareola grallaria*, feeding on the grubs. I secured any number of their eggs. Returning here I find birds much later in breeding. I have found at least thirty nests of the Western Brown Hawk, *H. occidentalis*, by far the commonest bird of prey, and an extremely noisy one. The eggs are two or three in number, much like Peregrines. The bird either makes a

new nest or repairs an old one. Some small white eggs with brown spots bother me much. I have found three in different small birds' nests with totally differently marked eggs. They must be the eggs of some parasitical bird, but appear too small for any of the Cuckoos here, being only as large as a Willow Wren's egg. The Pacific Heron, *Ardea pacifica*, and White-fronted Heron, *A. nova-hollandia*, are not uncommon here. I find a difficulty in identifying small birds, not having any plates to compare. Next week, all being well, I start overland to the south, hoping to get as far as Albany, and shall expect to come across many interesting forms,—amongst them the Leipoa, which breeds abundantly along the coast as far as this.—THOMAS CARTER (Gascoyne River, West Australia).

**Peculiarities in Eggs of the House Sparrow.**—Some peculiarities in the eggs of this bird appear to have been overlooked by ornithologists. The eggs forming a set, or clutch, are generally five; occasionally six are met with, but not more than one set in ten has that number—very probably not more than one set in twenty. In every set or clutch containing four, five, or six eggs, one egg—occasionally two—will be found of quite a different type, being, with very few exceptions of a lighter coloured ground than the others, with the colouring laid on in spots and blotches, instead of being diffused in specks more evenly over the whole surface of the shell. An odd egg of a darker colour than the others of the clutch is rarely met with, and in the ninety sets I have now before me there is only one set in which the odd egg has a ground of a slightly darker shade. The ninety sets of eggs to which I refer were all taken under my own supervision, and all blown by myself, so that I know them to be genuine sets and not made up. In every set containing four or five eggs, the odd egg appears, excepting in one clutch of four and one clutch of five. In these clutches the odd egg may have been dropped when the bird was from home. I will now mention the extreme infertility of the "odd egg," which I found last breeding season to be about sixty per cent. In the season of 1886 I found it to be seventy-five per cent. This egg is, I believe, as a rule, the fourth egg laid, for in clutches of five eggs I have found an egg of the usual type laid after the odd egg has appeared. During the last two breeding seasons I have had a very great number of clutches of eggs and also broods under my notice, taken over a considerable area in Hertfordshire, Cambridgeshire, and Essex, and I find the average clutch to be  $4\frac{1}{2}$  eggs, and the average brood to be only  $3\frac{1}{2}$  young birds; these figures show that about 30 per cent. of the eggs are unproductive. From these observations, which I have carefully made, the Sparrow is not so prolific as it is generally supposed to be, and it is quite possible for the "British farmer" to kill them down too close, and to his present troubles he may add worse enemies than the Sparrows to eat his crops.—JOSEPH P. NUNN (Royston).

**Disparity in Size and Colour of Eggs of the same Species.—**

Referring to the notes under this head in recent numbers of 'The Zoologist,' I can testify that an unusually small egg is not always the last one laid in a set. In April, 1886, I found in a Rook's nest two fresh eggs, one unusually large, the other a small one, about the size of a Sky Lark's egg. I took them both; the Rook did not forsake, but laid three more eggs, and in due time hatched two young birds. In this instance the small egg was probably the first of the clutch. Blue bullfinch-like eggs of the Chaffinch are not at all uncommon. I have found some half-dozen clutches of these eggs, and seen many more during the last few years.—E. W. H. BLAGG (Cheadle, Staffordshire).

**Long-tailed Duck and Common Skua in Dorsetshire.**—During the month of November several Long-tailed Ducks, *Harelda glacialis*, made their appearance in Poole Harbour, and five were shot, one of which was a fine adult male, the others birds of the year. In the same harbour a Great Skua, *Stercorarius catarrhactes* (Linn.), was observed in close proximity to a "company" of Wigeon, one of which it had apparently struck down, when a gunner, who was in pursuit of the latter birds, fired and killed it. It is now in the possession of Mr. Robert Burns, of Wimborne.—J. C. MANSEL-PLEYDELL (Whatcombe).

**Long-tailed Duck in Lincolnshire.**—The unusual immigration of the Long-tailed Duck, *Harelda glacialis*, during October and November last noticed by the Rev. H. A. Macpherson, in 'The Zoologist' (1887, p. 432), and subsequently in 'The Field' (pp. 773 & 852), has been very apparent on the North Lincolnshire coast and on the Humber. On October 24th I killed two at one shot at Tetney. On Nov. 15th three were exposed for sale in a game-shop at Great Grimsby, and on the 29th two more in the same shop. All these were said to have come from Killingholme, a village eight or nine miles above Grimsby. Many more of these ducks are reported to have been killed by wildfowl shooters on the Humber. All those above mentioned were in immature plumage.—G. H. CATON HAIGH (Grainsby Hall, Great Grimsby).

**The Long-tailed Duck.**—Saxby, who was very well acquainted with the Long-tailed Duck, has recorded that in December, 1868, a bird of this species was brought to him "in a very peculiar state of plumage, having a few large black spots upon the breast" ('Birds of Shetland,' p. 262). On December 1st, 1887, I obtained a somewhat analogous variety of this duck from a pile of Common Scoters in the Metropolitan Market. This differs from forty others that I have lately examined in the flesh, inasmuch as the upper breast is profusely spotted with dark brown spots about the size of a pea, the rest of the lower parts being pure white. A male that I sent to Mr. O. V. Aplin on November 27th showed a few black feathers appearing

on the breast, but this is, of course, quite normal. If the variation alluded to has been noticed by others, information would be welcome.—H. A. MACPHERSON (Carlisle).

[Is this phase of plumage abnormal? Is it not that of a drake at the end of its second year beginning to assume the spring plumage?—ED.]

**Bewick's Swan in Pembrokeshire.**—An adult specimen of Bewick's Swan was shot on November 10th, on Trevithan Pool, near St. David's, by Mr. C. Harding Harries. The bird was alone, and when the pond was approached it took refuge among some tame geese, swimming into their midst, depressing its body as low as it could in the water, and lowering its graceful neck in its attempts to conceal itself. But all in vain, as Mr. Harries waded out into the pool and shot it.—MURRAY A. MATHEW (Stone Hall, Pembrokeshire).

**Reported occurrence of the Goshawk in Norfolk.**—Mr. J. H. Gurney, jun., informs me that the Goshawk, *Astur palumbarius*, mentioned in my notes as "shot near Yarmouth," October 21st (Zool. 1887, p. 418), was caught in the North Sea on October 19th, and brought into Yarmouth by some smacksmen on the 21st.—T. E. GUNN (86, St. Giles Street, Norwich).

[This is doubtless the bird referred to in the 'Report on Migration' for 1886, p. 39, as "Goshawk, *Astur palumbarius*, caught at sea, and brought in alive to Yarmouth; date uncertain."—ED.]

**Jay in Co. Kildare.**—As the Jay is decidedly scarce and local in Ireland, perhaps it may be of interest to record that one of these birds was met with in Lyons demesne, Co. Kildare, on the 15th October last. The keeper who shot it brought it to me as a rare bird he had not seen before. He said it was alone, and attracted his attention by its notes. I have not known the Jay to occur in this district before. Can anyone say whether it is now a resident anywhere in this county, or in the adjoining counties of Wicklow, Dublin, or Meath? I do not recollect having seen any recent record of localities for the Jay in Ireland.—J. E. PALMER (Lyons Mills, Straffan, Co. Kildare).

[In his 'List of Irish Birds,' 1885, Mr. A. G. More says the Jay is resident but very local, occurring principally in the South and East of Ireland.—ED.]

**Wryneck in Shetland.**—A specimen of the Wryneck, *Jynx torquilla*, was picked up, dead, near Hillswick, Shetland, on the 25th August last. Being a little uncertain as to its species, I forwarded it to Edinburgh, when it was at once recognised by my friend Mr. Andrew Hogg. Only two specimens of this bird have, so far as I am aware, been previously seen in Shetland, both of which are mentioned in Saxby's 'Birds of Shetland.'—CHARLES A. ANDERSON (22, Melville Terrace, Edinburgh).



**Starling nesting in November.**—I have been informed from a reliable source that on the 12th November last a Starling's nest was found in the roof of a cottage in Aylesbury, containing hard-set eggs. Upon their being broken, the young birds were found within alive, which would no doubt have been hatched in a day or so, but in all probability they would not have survived throughout the cold weather.—F. HAYWARD PARROTT (Walton House, Aylesbury).

**Storm Petrel at Ipswich.**—Early in the morning of October 25th a Storm Petrel was picked up alive on the Norwich Road, Ipswich. It was in an exhausted condition, and died a few hours afterwards. It had been driven inland by stress of weather, a sharp and severe snow-storm having occurred the previous night.—E. W. GUNN (89, Prince's Street, Ipswich).

**Grey Phalarope in Lincolnshire.**—The Grey Phalarope is sufficiently rare in North Lincolnshire to render its occurrence worth notice. On December 1st one was shot at Tetney from one of the marsh drains by my man, who happened at the time to be carrying my gun. He had previously noticed the bird flying about a neighbouring stack-yard, but mistook it for a Dunlin until he saw it swimming in the drain. I have only once before met with this species in North Lincolnshire,—*viz.*, in the autumn of 1879,—when one was shot by my father on the Tetney sands.—G. H. CATON HAIGH (Grainsby Hall, Great Grimsby).

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## SCIENTIFIC SOCIETIES.

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### LINNEAN SOCIETY OF LONDON.

November 17, 1887.—DR. ST. GEORGE MIVART, F.R.S., Vice-President, in the chair.

A paper was read by Mr. Patrick Geddes, entitled "Some Factors of Variation in Plants and Animals." This part of the memoir dealt chiefly with plants and their shortening of the axis in leaf, flower, &c. According to him, the origin of species is to be found in soil and climate, on the one hand, and in a more or less distinct ebbing of the vegetative activities back from the growing point. Modification by descent is seen to take place along a definite line of change within which the action of natural selection can at best somewhat accelerate its journey, when it does not actually retard or exterminate it.

A communication was read on the *Copepoda* of Madeira and the Canary Islands, with descriptions of new genera and species, by Mr. Isaac C.

Thompson. From a pretty thorough examination of specimens obtained at the various islands of the Canaries and Madeira, it seems evident that the Copepodian fauna varies in quantity rather than specifically. Excepting several cases where locally one or two only of a species were found, and which probably indicate rarity of that species, their equal distribution amongst the islands seems general. Sixty-five species in all were obtained. Of these six are new to science, and three probably of generic significance. Of the total number twenty-three are known in British waters, and of these fourteen belong to the family *Harpacticidæ*.

December 1, 1887.—WM. CARRUTHERS, F.R.S., President, in the chair.

The following gentlemen were elected Fellows of the Society:—Mr. K. H. Bennett (Sydney, New South Wales), Lord Egerton of Tatton, Mr. W. Francis, the Rev. F. W. Galpin, Mr. W. G. M'Millan, Mr. A. J. North (Melbourne, Victoria), Mr. J. D. Ogilby (Sydney, New South Wales), Mr. A. S. C. Stuart (Madras), Mr. G. Swainson, Mr. I. C. Thompson, and Mr. C. Topp (Melbourne, Victoria).

There was exhibited, for Mr. O. Fraser, of the India Museum, Calcutta, a specimen of what was supposed to be a weather-worn seed of a palm. In a letter read at the meeting from Mr. Fraser the object in question was stated to have been picked up on the Madras coast, but could not be satisfactorily determined by the Indian authorities. The specimen having been examined by Dr. J. Anderson (late of Calcutta) and Mr. Dendy, of the British Museum, they inclined to regard it as possibly the consolidated roe of a fish, while Prof. C. Stewart surmised that the substance was vegetable in structure; the matter therefore remained *sub judice* pending microscopic and chemical investigation.

Sir John Lubbock read a paper, in continuation of his previous memoirs, on "The Habits of Ants, Bees, and Wasps." He said that it was generally stated that our English slave-making ant, *Formica sanguinea*, far from being entirely dependent on their slaves, as was the case with *Polyergus rufescens*, the slave-making ant *par excellence*, was really able to live alone, and that the slaves were only, so to say, a luxury. Some of his observations appeared to throw doubt on this. In one of his nests the ants were prevented from making any fresh capture of slaves. Under these circumstances the number of slaves gradually diminished, and at length the last died. At that time there were some fifty of the mistresses still remaining. These, however, rapidly died off, until at the end of June, 1886, there were only six remaining. He then placed near the door of the nest some pupæ of *Formica fusca*, the slave ant. These were at once carried in, and soon came to maturity. The mortality among the mistresses at once ceased, and from that day to this only two more have died. This seems to show that the slaves perform some indispensable function in the nest, though

what that is remains to be discovered. As regards the longevity of ants, he stated that the old queen ant, which had more than once been mentioned to the Society, was still alive. She must now be fourteen years old, and still laid fertile eggs; to the important physiological bearing of which fact he called special attention. He discussed the observations and remarks of Graber as regards the senses of ants, with special reference to their sensibility towards the ultra violet rays, and referred to the observations of Forel, which confirmed those he had previously laid before the Society. Professor Graber had also questioned some of his experiments with reference to smell. He, however, maintained the accuracy of his observations, and pointed out that Graber had overlooked some of the precautions which he had taken; his experiments seemed to leave no doubt as to the existence of a delicate sense of smell among ants. As regards the recognition of friends, he repeated some previous experiments with the same results. He took some pupæ from one of his nests (A) and placed these under charge of some ants from another nest (B) of the same species. After they had come to maturity he placed some in nest A and some in nest B. Those placed in their own nest were received amicably, those in the nests of their nurses were attacked and driven out. This showed that the recognition is not by the means of a sign or password, for in that case they would have been recognised in nest B and not in nest A. Dr. Weissmann had confirmed his observations in opposition to the statement of Lespis, that white ants are enemies to those of another nest, even belonging to the same species; the domestic animals, on the other hand, can be transferred from one nest to another, and will be amicably received. In conclusion, he discussed the respective functions of the eyes and ocelli, and referred to several other observations on various interesting points in the economy of the Social Hymenoptera.—J. MURIE.

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ZOOLOGICAL SOCIETY OF LONDON.

December 6, 1887.—Professor W. H. FLOWER, C.B., LL.D., F.R.S., President, in the chair.

Mr. Howard Saunders exhibited (on behalf of the Rev. H. A. Macpherson) a specimen of the Isabelline Chat, *Saxicola isabellina*, shot in Cumberland, being the first recorded occurrence of this species in Great Britain.

Prof. Bell exhibited and made remarks on specimens of the tegumentary glands from the head of the Rocky Mountain Goat, *Haplocerus montanus*.

A communication was read from Prof. H. H. Giglioli and Count T. Salvadori, containing notes on the fauna of Corea and the adjacent coast of Manchuria. These notes were founded on a large collection, principally of Vertebrates, made by order of H.R.H. Prince Thomas of Savoy, Duke of Genoa, whilst he was in command of the 'Vettor Pisani,' on a voyage round

the world, 1878—81. The collection was stated to be now deposited in the Royal Zoological Museum at Florence.

A communication was read from Mr. L. Taczanowski, containing a list of the birds collected in the Corea by M. J. Kalinowski between September, 1885, and March, 1887. A Woodpecker in the collection was considered to be new to science, and named *Thriponax kalinowskii*.

Prof. W. H. Flower read a paper on the Pigmy Hippopotamus of Liberia, *Hippopotamus liberiensis*, and its claims to distinct generic rank. The specimen of this animal in the National Collection possesses two incisor teeth on one side of the lower jaw. This and other considerations induced the author to question the advisability of separating it generically from *Hippopotamus*.

Mr. Francis Day communicated a paper by Mr. J. Douglas-Ogilby, of the Australian Museum, Sydney, on a new genus and species of Australian *Mugilidae*, which he proposed to designate *Trachystoma multdens*.

Mr. Day also read a second paper by Mr. Ogilby, giving the description of a new genus of *Percidae* based on examples taken in the Gulf of St. Vincent, South Australia, which the author proposed to describe as *Chthamaloptyx melbournensis*.

A communication was read from Dr. M. Menzbier, of Moscow, describing a third species of Caucasian Wild Goat. This he proposed to call *Capra severtzovi*, being the *C. caucasica* of Diinnik, but not of Guldenstädt.

Mr. Blanford read some critical notes on the nomenclature of Indian Mammals, in which he treated of *Macacus ferox*, Shaw (*M. silenus*, auct. nec Linn.), *M. irus*, Cuv. (*M. cynomolgus*, auct., nec Linn.), *M. rhesus*, *Presbytes thersites*, Blyth, *Semnopithecus chrysogaster*, *Felis bengalensis*, *F. jerdoni*, *Herpestes mungo* (*H. griseus*, auct., nec Geoffr.), *Vulpes vulgaris*, *V. alopec*, and the genera *Putorius*, *Mustela*, *Xantharpyra*, *Cynonycteris*, *Hipposiderus*, and *Phyllorhina*.—P. L. SCLATER, Secretary.

#### ENTOMOLOGICAL SOCIETY OF LONDON.

December 7, 1887.—Dr. DAVID SHARP, F.Z.S., President, in the chair.

Mr. C. E. Stanley-Phillips, of Shooter's Hill; Mr. H. W. Barker, of Peckham; and Herr E. G. Honrath, of Berlin, were elected Fellows.

Mr. Jenner Weir exhibited, and made remarks on, twelve specimens of *Cicadetta hæmatoides*, collected last summer in the New Forest by Mr. Charles Gulliver. Only one of the specimens was a male, from which it was inferred that the males were more active than the females, and quickly retreated when disturbed.

Mr. M'Lachlan exhibited a specimen of *Pterostichus madidus*, F., which he had recently found in a potato. It seemed questionable whether the beetle had been bred in the cavity or had entered it for predaceous purposes.



Mr. M'Lachlan also exhibited two specimens of a species of Trichoptera—*Neuronia clathrata*, Kol.—which occurred rarely in Burnt Wood, Staffordshire, and elsewhere in the Midlands. On enquiry he was informed that the two specimens exhibited had been found in the Tottenham Marshes by Mr. C. J. Boden.

Mr. Porritt exhibited a series of specimens of *Cidaria russata*, from Yorkshire, the Isle of Man, the Hebrides, and the South of England. The specimens from the two first-named localities were almost black.

Mr. Verrall exhibited a specimen of *Mycetæa hirta*, Marsh., which was found devouring a champagne cork. The Rev. Canon Fowler remarked that certain *Cryptophagi* had the same habit.

Mr. M'Lachlan, Mr. Jenner Weir, Dr. Sharp, and others.

Canon Fowler exhibited specimens of *Acronycta alni* and *Leiocampa dictæa*, which came to the electric light on Lincoln Cathedral during the Jubilee illuminations. He also exhibited a specimen of *Harpalus melancholicus*, Dej., from Kingsgate.

Mr. Billups exhibited, for Mr. Bignell, an interesting collection of British oak-galls. He also exhibited the cocoon and pupa-case of a South American moth from which he had bred 140 specimens of a species of Ichneumon.

Mr. O. Janson exhibited, for Mr. C. B. Mitford, a collection of Lepidoptera from Sierra Leone.

Mr. White exhibited a female specimen of *Composia olympia*, Butl., from Florida. He also exhibited a curious structure formed by white ants at Akyab, Burmah.

Mr. Waterhouse exhibited a series of diagrams of the wings of insects, and read "Notes of observations on the homologies of the veins"—a subject to which he had given especial attention for some time past.

Mr. G. T. Baker contributed "Descriptions of new species of Lepidoptera from Algiers."

Mr. Gervase F. Mathew, R.N., communicated a paper entitled "Life-histories of Rhopalocera from the Australian Region." The paper was accompanied by elaborate coloured drawings of the perfect insects, their larvæ and pupæ.

Mr. Frederic Merrifield read a "Report of Progress in Pedigree Moth-breeding, with observations on incidental points." He also exhibited a large number of specimens of *Selenia illunaria*, &c., showing the results of the experiments he had been making.

Mr. Francis Galton alluded to the close attention Mr. Merrifield had given to the subject, and complimented him on the neatness, ingenuity, and skill with which his experiments had been conducted, and on the results he had obtained therefrom. Mr. Poulton, Dr. Sharp, Prof. Meldola, and others continued the discussion.—H. Goss, *Hon. Secretary*.

## NOTICES OF NEW BOOKS.

*A Vertebrate Fauna of Sutherland, Caithness, and West Cromarty,*  
By J. A. HARVIE BROWN and T. E. BUCKLEY. 8vo, pp. 344,  
with Illustrations. Edinburgh: Douglas. 1887.

THIS volume is understood to be the first of a series on the Vertebrate Zoology of Northern Scotland considered in its physical aspects. Such a spirited venture can hardly fail to enlist the sympathy and support of all working naturalists. Commencing with an elaborate scenic description of the area explored, the writers' experience, extending over eighteen years, has enabled them to supply a very striking narrative. Whether the "great brown saucer" of Caithness, with its dreary monotonous expanse of "flows," or "the birch-clad hollows, sparkling rivers and cascades" of western Sutherland be described, the authors' style is equally felicitous. A single example may suffice to indicate the general character of the earlier chapters. The parish of Assynt is computed to include upwards of 300 lochs:—

"These gems, set in the dark moorland or high on the shoulder of one of the monarchs of mountains, glisten and dance in the joy of summer sunshine, or fade and gleam more darkly in the winter rain and snow drift. . . . Many of these lovely sheets of water are studded over with birch-clad islets, under the branches of which flourish the giant fronds of the great royal fern, *Osmunda regalis*. . . . Nor is life absent here in the bright summer time. The sweet plaintive song of the Willow Warbler, the startling cry of the Common Sandpiper, the trill of the Dunlin, the *Teoch-vingh* of the Greenshank,—from which this last species gets its Gaelic name,—or the wail of the Curlew, and the discontented chatter of the Gulls, are ever constant to the ear. The Heron builds her unshapely nest on birch trees, only a few feet from the ground, and the Hooded Crow flies silently on predatory quest intent, while close to shore, off some green island in the centre, swims a Black-throated Diver, occasionally uttering his hoarse and guttural greeting to his mate, as she sits on her two dark olive eggs, only a few feet from the water's edge."

The avifauna of these counties includes about 116 breeding species, among the most notable of which are the Golden Eagle, Peregrine, Hen Harrier, Ptarmigan, Greylag Goose, Common Scoter, Goosander, and two species of Diver. The White-tailed Eagle, formerly abundant, has dwindled in numbers of late years, no less on the mainland than in the Hebrides, but the Golden

Eagle appears to be on the increase, thanks to the protection afforded by large deer-forests. Incidentally, we may mention that a dozen Golden Eagles were sent, in the flesh, to an Inverness birdstuffer during the present year. The Kite and Osprey have vanished from their wild retreats, and even the Raven requires some grace at the hands of game-preservers. It is difficult to understand why this fine bird should be made the object of ruthless persecution, when we remember how rarely it feeds on other substances than carrion. The Cornish Chough can no longer be included in this region, nor is there any suggestion that it was ever abundant.

Most lamentable as well as inexcusable is the insufficient protection afforded by Highland lairds to the Greylag Goose, which is fast decreasing, many of its former breeding-stations having been abandoned of late years. Sportsmen will regret the decrease of the Ptarmigan on the high mountains. Reference should be made to the partial migration of this species recorded at p. 311, where particulars are given of the occurrence of a party "at a very great distance from their nearest breeding-ground." Nor can we pass over unnoticed the interesting description which is given (pp. 137—143) of the discovery of the nesting of the Snow Bunting on the Scottish mainland, with a coloured plate of the bird, and a view of the locality.

The recent discovery of small colonies of Tree Sparrows in the Hebrides had partly prepared us to expect that this local bird would be reported from Sutherland, nor are we disappointed in the expectation. Of equal interest is the movement northwards of the Stock Dove. Mr. Buckley shot a specimen at Kintradwell on September 22nd, 1887, and, as it is now known to nest on the Morayshire coast, we shall doubtless soon receive intelligence of its breeding in the two most northern counties. Another advancing species is the Chiffchaff. The Tree Pipit, Wood Wren, and Pied Flycatcher breed within this faunal area, as, of course, do the Spotted Flycatcher, and, more numerous, the Willow Wren; but the Blackcap appears to be little more than a chance visitor, as is the erratic Turtle Dove, while the Yellow Wagtail, Lesser Whitethroat, Garden Warbler, and Grasshopper Warbler are absent from the catalogue.

The extensive coast-line appears to be singularly destitute of waders, only excepting such cosmopolitan species as the Whim-

brel, Redshank, Turnstone, and Oystercatcher; the Knot and Sanderling occur only as stragglers, whilst the Grey Plover, Green Sandpiper, and Little Stint have only been detected in one or two instances.

The list of *Laridæ* includes the Glaucous, Iceland, Ivory, Little and Sabine's Gull, a specimen of the latter having occurred in full summer dress—a stage which has been procured in the British Islands only in two or three instances. The Snowy Owl, Iceland and Greenland Falcon, Parrot Crossbill, American Bittern, Rose Pastor, and Waxwing stand on the list; but the evidence as to White's Thrush and the Lapp Bunting is unsatisfactory. The Black Redstart, however, has certainly reached these northern shores, for a specimen was sent to Mr. Harvie Brown from the Pentland Skerries.

Taking into consideration the limited extent to which the coast of Caithness is influenced by external migration, the authors, as well as their able correspondents Messrs. Peach and Reid, deserve to be congratulated on the number of rare species accredited to the county.

Mr. Harvie Brown's researches into the Mammals of Scotland are so well known that detailed reference is unnecessary. While the diminishing numbers of Wild Cat and Marten are much to be regretted, it is gratifying to find that six species of Cetacea are included in the work, considering how little attention has been paid to this order by British naturalists. Perhaps the most important mammalian records refer to the Greenland Seal, two examples of which are recorded on satisfactory evidence.

Reptiles and Amphibians (including the Palmate Newt) naturally occupy a very small portion of the volume; but greater weight attaches to a List of Fishes frequenting the Moray Firth. This comprises 141 species out of a British list of 225; but the American Brook Trout, *Salmo fontinalis*, should have been omitted, for the Duke of Sutherland's attempt to naturalise the species seems to have proved a failure. Amongst the rarer fishes, the Torpedo, Bergylt, Sword-fish, Hair-tail, Opal, and Deal-fish stand pre-eminent.

Of the few misprints which have escaped notice, the substitution of the Black-eared Chat for the Black-throated Wheatear deserves correction. The index is one of the best we have seen, and the illustrations are well chosen and well engraved.

